



(11) **EP 1 523 207 B9**

(12) **CORRECTED EUROPEAN PATENT SPECIFICATION**

(15) Correction information:

Corrected version no 1 (W1 B1)

Corrections, see

**Description Paragraph(s) 8, 13, 16-18, 21,
22, 33-35**

Claims EN

(51) Int Cl.:

H04Q 7/38 (2006.01)

(48) Corrigendum issued on:

29.10.2008 Bulletin 2008/44

(45) Date of publication and mention
of the grant of the patent:

27.02.2008 Bulletin 2008/09

(21) Application number: **03022862.1**

(22) Date of filing: **08.10.2003**

(54) **Method and apparatus for dynamic packet transport in CDMA2000 networks**

Verfahren und Vorrichtung zur dynamischen Paketübertragung in CDMA2000 Netzwerken

Procédé et appareil pour le transport dynamique de paquets dans des réseaux CDMA2000

(84) Designated Contracting States:

**AT BE BG CH CY CZ DE DK EE ES FI FR GB GR
HU IE IT LI LU MC NL PT RO SE SI SK TR**

Designated Extension States:

AL LT LV MK

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(43) Date of publication of application:

13.04.2005 Bulletin 2005/15

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Description

FIELD OF THE INVENTION

[0001] The present invention relates to a method and apparatus for sending reverse and forward link data from and to a mobile device, and more specifically for sending reverse and forward link data without establishing a dedicated data Traffic Channel.

BACKGROUND

[0002] Wireless data devices are well known in the art. These devices provide a user with the capability of utilizing data services such as e-mails, browsers, or short message services (SMS). These devices further allow the use of data services wirelessly and while mobile.

[0003] In current CDMA 2000 networks, data packets are always sent out on a dedicated data Traffic Channel. On power-up of the wireless device, this Traffic Channel is obtained by attempting to obtain a valid Internet protocol (IP) address from a network. The device does this by attempting to establish a dedicated data Traffic Channel and then a point-to-point protocol (PPP) session. Once the device is assigned a valid IP address, the device is allowed to send or receive Packet Data through the Internet routed by the public data serving node (PDSN).

[0004] If no Packet Data is sent or received by the wireless data device within a certain time period, the device or the network releases the dedicated Traffic Channel assigned to the device. The PPP session is still kept even after the Traffic Channel is released. At this point, the device goes into a dormant state and stays in this dormant state until a new data packet is sent or received. When a new data packet is sent or received, the device re-establishes the dedicated Traffic Channel in order to send or receive any new data packet.

[0005] Always sending and receiving packet Data on dedicated data Traffic Channels is not efficient with regards to both network resources and battery life of the data device. Network resources are wasted by having a dedicated data Traffic Channel for each wireless device. If the wireless device only occasionally sends or receives Packet Data, a dedicated data Traffic Channel may need to be established and kept for each outgoing or incoming packet.

[0006] With regards to the battery life of the wireless data device, the establishment of a dedicated data Traffic Channel involves all processing messages exchanged between the device and the network. This costs the device battery life to establish the dedicated data Traffic Channel. Further, keeping a data Traffic Channel up also requires more transmission power, which also affects the battery life.

[0007] A further problem with current CDMA2000 networks is that they do not support simultaneous voice and data services. A device is not allowed to send or receive

data packets when the device has already established dedicated voice Traffic Channel from its dormant state.

[0008] In cases of UMTS services, dynamic selection of a channel pair has been done. For example, US Patent No. 6,347,091 to Wallentin et al., US Patent No. 6,519,461 to Anderson et al., and European Patent Application No. 1,307,009 all teach the dynamic selection of a channel by a network. These references, however, select the channel to deal with quality of service and data buffer sizes to optimize a UMTS network, and do not deal with the saving of battery life or the elimination of network overhead needed in establishing a dedicated data traffic channel. Selection is done at the network side and is in some of the above based on a complex algorithm.

[0009] US Patent Application No. 2002/126,641 to Bender is another reference of interest. However, Bender merely deals with the monitoring of a channel in a CDMA2000 network for quality.

SUMMARY OF THE INVENTION

[0010] The present invention seeks to overcome the deficiencies in the prior art by providing a method and apparatus for reverse and forward link dynamic packet transport without the establishment of a dedicated data Traffic Channel. Specifically, the present invention allows for the sending of data in the form of a Data Burst Message along either the reverse access channel or within a dedicated Traffic Channel, such as a voice traffic channel.

[0011] CDMA2000 networks provide the frame transport capability of sending short packets on the reverse access channel. The capability of the reverse access channel is broadcast on the Paging channel with the Access Primary messages. The wireless device can therefore send data packets on this reverse Access Channel within the maximum transport capabilities of this reverse Access Channel.

[0012] Alternately, a data packet can be encapsulated as a Data Burst Message within a dedicated Traffic Channel, such as the voice traffic channel. The capability of the voice Traffic Channel is known to the wireless device and, as long as the data packet is within the voice Traffic Channel maximum transport capability, it can be sent as a Data Burst Message.

[0013] Further, a forward link message can be forwarded as a Data Burst Message. When the PDSN receives a data packet, it checks the packet size. If the packet is small enough to transport on the forward common channel (e.g. Page Channel), the PDSN sends the packet data in a Data Burst Message adding a header for the Data Burst as "Packet Data".

[0014] The present invention therefore provides a method for reverse link dynamic packet transport from a wireless data device in a CDMA2000 network, said method comprising the steps of: determining a frame transport capability of a reverse access channel; checking whether a data packet falls within said frame transport capability;

and if said data packet falls within said frame transport capability encapsulating said data packet as a data burst message; sending said data burst message over said reverse access channel; receiving said data burst message at a base station controller; and reforming said data packet.

[0015] The present invention further provides a method for reverse link dynamic packet transport from a wireless data device in a CDMA2000 network in which a dedicated traffic channel is established, said method comprising the steps of: determining whether said dedicated traffic channel supports data transmission; if said dedicated traffic channel supports data transmission, determining a frame transport capability of said dedicated traffic channel; checking whether a data packet falls within said frame transport capability; and if said data packet falls within said frame transport capability encapsulating said data packet as a data burst message; sending said data burst message over said dedicated traffic channel; receiving said data burst message at a base station controller; and reforming said data packet.

[0016] The present invention still further provides an apparatus for reverse link dynamic packet transport in a CDMA2000 network, said apparatus comprising: a wireless data device including: means to check a data packet transport capability of a reverse access channel; means to check a data packet to determine whether it falls within said data packet transport capacity; means to encapsulate a data packet as a burst data message; and a transmitter to send said burst data message over said reverse access channel; a base station controller including: a receiver for receiving said data burst message; a means to check whether said data burst message is packet data; and a means for forwarding said data burst message to a packet data serving node if said data burst message is packet data; and a packet data serving node, including: a means to reform said data packet wherein said wireless data device can dynamically send said data packet over said reverse access channel.

[0017] The present invention yet further provides an apparatus for reverse link dynamic packet transport in a CDMA2000 network, said apparatus comprising: a wireless data device including: means to check a data packet transport capability of a dedicated traffic channel; means to check a data packet to determine whether it falls within said data packet transport capacity; means to encapsulate a data packet as a burst data message; and a transmitter to send said burst data message over said dedicated traffic channel; a base station controller including: a receiver for receiving said data burst message; a means to check whether said data burst message is packet data; and a means for forwarding said data burst message to a packet data serving node if said data burst message is packet data; and a packet data serving node, including: a means to reform said data packet wherein said wireless data device can dynamically send said data packet over said dedicated traffic channel.

[0018] The present invention still further provides a

method for forward link dynamic packet transport from a base station controller to a wireless data device in a CDMA2000 network, said method comprising the steps of: determining a frame transport capability of a forward common channel; checking whether a data packet falls within said frame transport capability; and if said data packet falls within said frame transport capability; encapsulating said data packet as a data burst message; sending said data burst message over said forward common channel; receiving said data burst message at said wireless data device; and reforming said data packet.

BRIEF DESCRIPTION OF THE DRAWINGS

[0019] The present invention is best understood with reference to the drawings, in which:

FIGURE 1 is a schematic view of a wireless device within a CDMA 2000 network;

FIGURE 2 is a flow chart of the steps involved in passing a message along the reverse link;

FIGURE 3 is a decision tree for determining which channel will be used to pass the message; and

FIGURE 4 is a flow chart of the steps involved in passing a message along the forward link.

DETAILED DESCRIPTION OF THE DRAWINGS

[0020] Reference is now made to Figure 1. As illustrated, a wireless data device 10 is able to send or receive Packet Data on a Traffic Channel 12 or an Access Channel 14 depending on the packet size. The message is sent using airlink 16 to a base station controller 18. Depending on the message it can then be sent to the packet data serving node 20 from which it can access the Internet 22 or a variety of devices 24, as is known to those skilled in the art.

[0021] Reference is now made to Figure 2. In the wireless device 10, an application layer is notified of the serving CDMA 2000 systems access channel and voice Traffic Channel maximum transport capabilities. Before Packet Data is sent the application layer in step 30 checks the network transport capability and in step 32 looks at the packet type in order to decide the packet transport mode. The application layer further checks to see whether the message is an e-mail packet or not in step 34. If it is an e-mail packet the destination e-mail address is included in the Packet Data.

[0022] The application layer, in step 36, next creates a Data Burst Message (DBM) if Data Burst Messages are to be used for transmission. The burst type in the DBM is indicated as Packet Data and includes information about whether the packet is an e-mail message.

[0023] The Data Burst Message can then be sent to the base station controller 18 using data Traffic Channel 40, dedicated Traffic Channel 42 or reverse Access Channel 44 as is explained in more detail below.

[0024] Once the base station controller 18 receives a

Data Burst Message on the reverse link, the base station controller checks the burst type in step 50 and if the burst type is Packet Data, the base station controller forwards the Data Burst Message to the packet data serving node (PDSN) 20. The PDSN 20 decapsulates the Data Burst Message and reforms the packet to transport over the Internet 22 in step 52. The PDSN further keeps the originating device's e-mail address and the international mobile station identity (IMSI) mapping table. If the Data Burst Message is an e-mail packet, both the originating and destination e-mail addresses are included in the packet.

[0025] As one skilled in the art will realize, the upper layer of a device should implement a retransmission scheme to recover any data packet loss in the airlink. When using Data Burst Messages, the Radio Link Protocol (RLP) is not used, and thus packet loss is possible.

[0026] Reference is now made to Figure 3. Before sending Packet Data the application layer on the wireless data device 10 decides the packet transfer mode based upon the network capacity and the packet type.

[0027] Upon transmission to the radio link, the device Packet Data state is also checked. In step 60, the application layer checks to see whether a data Traffic Channel is already established. If a data Traffic Channel is already established then a message is always sent in step 62 over the dedicated data Traffic Channel.

[0028] If, however, no data Traffic Channel was found to be established in step 60 the application layer moves to step 64. In step 64, the application layer checks whether a dedicated Traffic Channel is established. Such a dedicated Traffic Channel can include a voice traffic channel, but it is not intended to limit the present invention to a voice traffic channel, and any dedicated Traffic Channel could be used.

[0029] If a dedicated Traffic Channel is established, the application layer next moves to step 66 in which it checks whether data can be sent on the dedicated channel. If data can be sent on the dedicated channel the application layer moves to step 68 in which the message size is checked to determine whether it is less than the data capability of the dedicated Traffic Channel. If in step 68 it is determined that the message size is less than the data capability then the message is sent over the dedicated Traffic Channel in step 70.

[0030] Conversely, if no dedicated Traffic Channel has been established, if data cannot be sent over the dedicated channel, or if the message size is greater than the data capability of the dedicated Traffic Channel, as determined in steps 64, 66 and 68 respectively, the application layer next moves to step 72.

[0031] In step 72, the application layer determines whether data can be sent on the reverse access channel. If data can be sent on the reverse access channel, the application layer moves to step 74 in which it checks whether the message size is less than the data capability of the reverse access channel. If the message size is less than the data capability of the reverse access channel, then the message is sent over the reverse access

channel in step 76.

[0032] If data cannot be sent over the reverse access channel or if the message size is greater than the data capability of the reverse access channel, as determined in step 72 and 74, then the wireless data device establishes a dedicated data Traffic Channel in step 78 and messages are then sent over the dedicated data Traffic Channel.

[0033] One skilled in the art will realize that other methods can be used for determining which channel to send the data packets on. This could include using the reverse Access Channel as a preferred channel over the dedicated Traffic Channel. It could further include only checking either the reverse access channel or the dedicated Traffic Channel, and establishing a data Traffic Channel if that one channel is unavailable to be used. Other possibilities will be apparent to one skilled in the art.

[0034] Reference is now made to Figure 4. When PDSN 20 receives a data packet, an application layer is notified of the serving CDMA 2000 system's forward common channel maximum transport capability. Before Packet Data is sent the application layer in step 30 checks the network transport capability and in step 32 looks at the packet type in order to decide the packet transport mode.

[0035] The application layer, in step 36, next creates a Data Burst Message (DBM) if Data Burst Messages are to be used for transmission. The burst type in the DBM is indicated as Packet Data.

[0036] The Data Burst Message can then be sent through base station controller 18 and to the wireless device 10 using data Traffic Channel 40 or the forward common channel 46 similarly to the method described above for the reverse access channel.

[0037] Once the wireless device 10 receives a Data Burst Message on the forward link, the wireless device checks the burst type in step 50 and if the burst type is Packet Data, the wireless device removes the Data Burst header in step 52 and passes the packet to its application layer.

[0038] As with the reverse link, one skilled in the art will realize that the upper layer of the PDSN device should implement a retransmission scheme to recover any data packet loss in the airlink because RLP is not used.

[0039] The present invention overcomes the disadvantages of the prior art by providing a way to send data traffic without having to establish a dedicated data Traffic Channel. This saves both network resources by not having a dedicated data Traffic Channel and by not requiring the messages needed for the establishment of the dedicated data Traffic Channel. The present invention further saves the battery life of the wireless data device by not requiring the additional messages for establishing a dedicated data Traffic Channel.

[0040] The above-described embodiments of the present invention are meant to be illustrative of preferred embodiments and are not intended to limit the scope of the present invention. Also, various modifications, which

would be readily apparent to one skilled in the art, are intended to be within the scope of the present invention. The only limitations to the scope of the present invention are set forth in the following claims depended hereto.

Claims

1. A method for saving battery life on a wireless data device (10) and for saving network resources in a CDMA2000 network, said method being performed at the wireless data device (10) and comprising the steps of:

if a dedicated traffic channel (42) is not established between the wireless data device (10) and the CDMA2000 network,
determining a frame transport capability of a reverse access channel (44);
checking whether a size of a data packet falls within said frame transport capability; and
if the size of said data packet falls within said frame transport capability
encapsulating said data packet as a data burst message; and
sending said data burst message over said reverse access channel (44),
wherein said sending step over said reverse access channel (44) precludes a dedicated data traffic channel (42) being established for said data burst message thereby saving battery life of said wireless data device (10) and network resources on said CDMA2000 network.

2. The method of claim 1, wherein
if a dedicated voice traffic channel is established, said method further comprising the steps of:

determining whether the dedicated voice traffic channel supports data transmission;
if said dedicated voice traffic supports data transmission,
determining a frame transport capability of said dedicated voice traffic channel;
checking whether the size of said data packet falls within said frame transport capability; and
if the size of said data packet falls within said frame transport capability
encapsulating said data packet as a data burst message; and
sending the data burst message over said dedicated voice traffic channel;
wherein said sending the data burst message over the dedicated voice traffic channel precludes a dedicated data traffic channel (42) being established for said data burst message thereby saving battery life of said wireless data device (10) and network resources on said

CDMA2000 network.

3. The method of claim 1, wherein the data burst message is received at a base station controller (18).
4. The method of claim 2, wherein said encapsulating step further adds an email address of said wireless device (10) to said data burst message if said data packet is an email.
5. The method of claim 3, wherein said base station controller (18) further forwards the data burst packet to a packet data serving node (20) if the data burst packet is comprised of packet data.
6. The method of claim 5, wherein said packet data serving node (20) reforms said data burst message.
7. An apparatus for reverse link dynamic packet transport in a CDMA2000 network, said apparatus comprising:

a wireless data device including:

means to check a data packet transport capability of a reverse access channel (44);
means to check a data packet to determine whether it falls within said data packet transport capacity;
means to encapsulate a data packet as a burst data message; and
a transmitter to send said burst data message over said reverse access channel (44);

a base station controller (18) including:

a receiver for receiving said data burst message;
a means (50) to check whether said data burst message is packet data; and
a means for forwarding said data burst message to a packet data serving node (20) if said data burst message is packet data; and

a packet data serving node (20), including:

a means (52) to reform said data packet wherein said wireless data device (10) can dynamically send said data packet over said reverse access channel (44) thereby precluding the wireless data device (10) from establishing a dedicated data traffic channel (42) with said CDMA2000 network, saving battery life at said wireless data device (10) and network resources at said CDMA 2000 network.

Patentansprüche

1. Verfahren zur Schonung einer Batterielebensdauer auf einer drahtlosen Datenvorrichtung (10) und zur Schonung von Netzwerkressourcen in einem CDMA2000-Netzwerk, wobei das Verfahren an der drahtlosen Datenvorrichtung (10) durchgeführt wird und die Schritte aufweist:

wenn kein zugeteilter Verkehrskanal (42) zwischen der drahtlosen Datenvorrichtung (10) und dem CDMA2000-Netzwerk hergestellt ist, Bestimmen einer Rahmentransportfähigkeit eines Rückwärtszugriffskanals (44);
Prüfen, ob eine Größe eines Datenpakets in die Rahmentransportfähigkeit fällt; und
wenn die Größe des Datenpakets in die Rahmentransportfähigkeit fällt, Einkapseln des Datenpakets als eine Daten-Burst-Nachricht; und
Senden der Daten-Burst-Nachricht über den Rückwärtszugriffskanal (44),
wobei der Senden-Schritt über den Rückwärtszugriffskanal (44) ausschließt, dass ein zugeteilter Datenverkehrskanal (42) für die Daten-Burst-Nachricht aufgebaut wird, wodurch die Batterielebensdauer der drahtlosen Datenvorrichtung (10) und Netzwerkressourcen auf dem CDMA2000-Netzwerk geschont werden.

2. Verfahren gemäß Anspruch 1, wobei wenn ein zugeteilter Sprachverkehrskanal hergestellt ist, das Verfahren weiter die Schritte aufweist:

Bestimmen, ob der zugeteilte Sprachverkehrskanal eine Datenübertragung unterstützt;
wenn der zugeteilte Sprachverkehrskanal eine Datenübertragung unterstützt, Bestimmen einer Rahmentransportfähigkeit des zugeteilten Sprachverkehrskanals;
Prüfen, ob die Größe des Datenpakets in die Rahmentransportfähigkeit fällt; und
wenn die Größe des Datenpakets in die Rahmentransportfähigkeit fällt, Einkapseln des Datenpakets als eine Daten-Burst-Nachricht; und
Senden der Daten-Burst-Nachricht über den zugeteilten Sprachverkehrskanal;
wobei das Senden der Daten-Burst-Nachricht über den zugeteilten Sprachverkehrskanal ausschließt, dass ein zugeteilter Datenverkehrskanal (42) für die Daten-Burst-Nachricht aufgebaut wird, wodurch die Batterielebensdauer der drahtlosen Datenvorrichtung (10) und Netzwerkressourcen auf dem CDMA2000-Netzwerk geschont werden.

3. Verfahren gemäß Anspruch 1, wobei die Daten-

Burst-Nachricht an einer Basisstation-Steuervorrichtung (18) empfangen wird.

4. Verfahren gemäß Anspruch 2, wobei der Einkapseln-Schritt weiter eine Email-Adresse der drahtlosen Vorrichtung (10) zu der Daten-Burst-Nachricht hinzufügt, wenn das Datenpaket eine Email ist.
5. Verfahren gemäß Anspruch 3, wobei die Basisstation-Steuervorrichtung (18) weiter das Daten-Burst-Paket an einen Paketdatendienstknoten (20) weiterleitet, wenn das Daten-Burst-Paket aus Paketdaten besteht.
6. Verfahren gemäß Anspruch 5, wobei der Paketdatendienstknoten (20) die Daten-Burst-Nachricht neu bildet.
7. Vorrichtung für einen dynamischen Pakettransport auf der Rückwärtsverbindung in einem CDMA2000-Netzwerk, wobei die Vorrichtung aufweist:

eine drahtlose Datenvorrichtung mit:

Mitteln zum Prüfen einer Datenpakettransportfähigkeit eines Rückwärtszugriffskanals (44);
Mitteln zum Prüfen eines Datenpakets, um festzustellen, ob es in die Datenpakettransportfähigkeit fällt;
Mitteln zum Einkapseln eines Datenpakets als eine Daten-Burst-Nachricht; und
einem Sender, um die Daten-Burst-Nachricht über den Rückwärtszugriffskanal (44) zu senden,

eine Basisstation-Steuervorrichtung (18) mit:

einem Empfänger zum Empfangen der Daten-Burst-Nachricht;
einem Mittel (50), um zu prüfen, ob die Daten-Burst-Nachricht Paketdaten sind; und
einem Mittel zum Weiterleiten der Daten-Burst-Nachricht an einen Paketdatendienstknoten (20), wenn die Daten-Burst-Nachricht Paketdaten sind; und

einen Paketdatendienstknoten (20) mit:

einem Mittel (52) zur Neubildung des Datenpakets,

wobei die drahtlose Datenvorrichtung (10) dynamisch das Datenpaket über den Rückwärtszugriffskanal (44) senden kann, wodurch ausgeschlossen wird, dass die drahtlose Datenvorrichtung (10) einen zugeteilten Datenverkehrskanal (42) mit dem CDMA2000-Netzwerk aufbaut, wodurch die Batterie-

rielebensdauer an der drahtlosen Datenvorrichtung (10) und Netzwerkressourcen auf dem CDMA2000-Netzwerk geschont werden.

Revendications

1. Procédé pour économiser la durée de vie d'une batterie sur un dispositif (10) de données sans fil et pour économiser des ressources de réseau dans un réseau CDMA2000, ledit procédé étant réalisé sur le dispositif (10) de données sans fil et comprenant les étapes consistant à:

si un canal (42) de trafic spécialisé n'est pas établi entre le dispositif (10) de données sans fil et le réseau CDMA2000,

déterminer une capacité de transport de trame d'un canal (44) d'accès de retour ; vérifier si une dimension d'un paquet de données se situe à l'intérieur de ladite capacité de transport de trame ; et

si la dimension dudit paquet de données se situe à l'intérieur de ladite capacité de transport de trame à

encapsuler ledit paquet de données comme un message en rafale de données ; et envoyer ledit message en rafale de données sur ledit canal (44) d'accès de retour,

dans lequel ladite étape d'envoi sur ledit canal (44) d'accès de retour empêche un canal (42) de trafic de données spécialisé d'être établi pour ledit message en rafale de données économisant ainsi la durée de vie de la batterie dudit dispositif (10) de données sans fil et des ressources du réseau sur ledit réseau CDMA2000.

2. Procédé selon la revendication 1, dans lequel si un canal de trafic de voix spécialisé est établi, ledit procédé comprenant en outre les étapes consistant à :

déterminer si le canal de trafic de données vocales spécialisé prend en charge la transmission de données ;

si ledit trafic de données vocales spécialisé prend en charge la transmission de données, déterminer une capacité de transport de trame dudit canal de trafic de données vocales spécialisé ;

vérifier si la dimension dudit paquet de données se situe à l'intérieur de ladite capacité de transport de trame ; et

si la dimension dudit paquet de données se situe à l'intérieur de ladite capacité de transport de trame

encapsuler ledit paquet de données comme un message e rafale de données ; et

envoyer le message en rafale de données sur ledit canal de trafic de données vocales spécialisé ;

dans lequel ledit envoi du message en rafale de données sur lesdites données de canal de trafic de données spécialisé empêche un canal (42) de trafic de données spécialisé d'être établi pour ledit message en rafale de données économisant ainsi une durée de vie de batterie dudit dispositif (10) de données sans fil et des ressources de réseau sur ledit réseau CDMA2000.

3. Procédé selon la revendication 1, dans lequel le message en rafale de données est reçu au niveau d'un contrôleur (18) de station de base.

4. Procédé selon la revendication 2, dans lequel ladite étape d'encapsulation ajoute en outre une adresse de courrier électronique dudit dispositif (10) sans fil audit message en rafale de données si ledit paquet de données est un courriel.

5. Procédé selon la revendication 3, dans lequel ledit contrôleur (18) de station de base transfère en outre le paquet en rafale de données à un noeud (20) de desserte de paquets de données si le paquet en rafale de données est constitué de données de paquets.

6. Procédé selon la revendication 5, dans lequel ledit noeud (20) de desserte de paquets de données reforme ledit message en rafale de données.

7. Appareil pour un transport de paquets dynamique de liaison de retour dans un réseau CDMA2000, ledit appareil comprenant :

un dispositif de données sans fils comprenant :

un moyen pour vérifier une capacité de transport de paquets de données d'un canal (44) d'accès de retour ;

un moyen pour vérifier un paquet de données pour déterminer s'il se situe à l'intérieur de ladite capacité de transport de paquet de données ;

un moyen pour encapsuler un paquet de données comme un message de données en rafale ; et

un émetteur pour envoyer ledit message de données en rafale sur ledit canal (44) d'accès de retour ;

un contrôleur (18) de station de base comprenant :

un récepteur pour recevoir ledit message en rafale de données ;

un moyen (50) pour vérifier si ledit mes-

sage en rafale de données constitue
des données de paquet ; et
un moyen pour transférer ledit message en rafale de données à un noeud
(20) de desserte de paquets de données si ledit message en rafale de données constitue des données de
paquet ; et
un noeud (20) de service de données
de paquet, comprenant :

un moyen (52) pour reformer ledit
paquet de données
dans lequel ledit dispositif (10) de
données sans fil peut envoyer de
manière dynamique ledit paquet
de données sur ledit canal (44)
d'accès de retour, empêchant ainsi
le dispositif (10) de données sans
fil d'établir un canal (42) de trafic
de données spécialisé avec ledit
réseau CDMA2000, économisant
la durée de vie de la batterie au niveau du dispositif (10) de données
sans fil et des ressources de réseau au niveau dudit réseau
CDMA2000.

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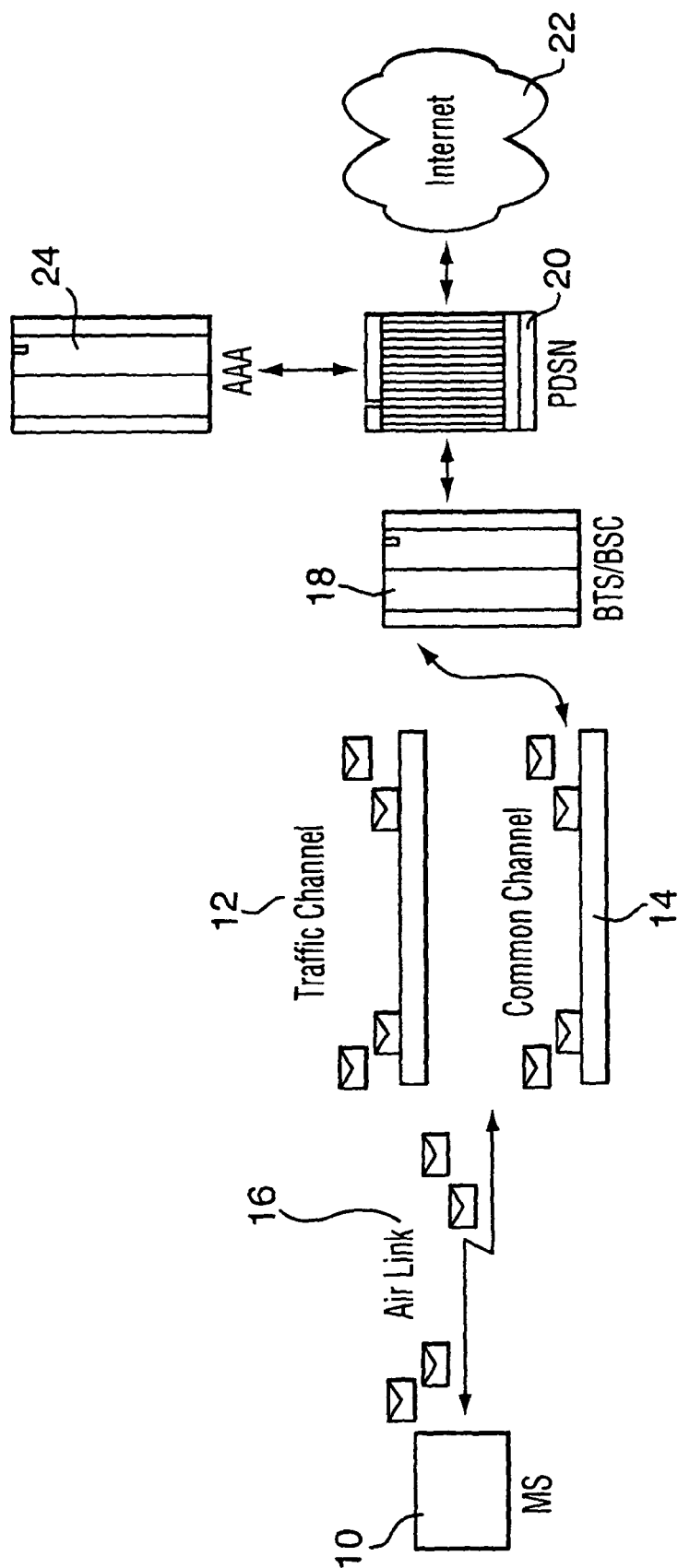


FIG. 1

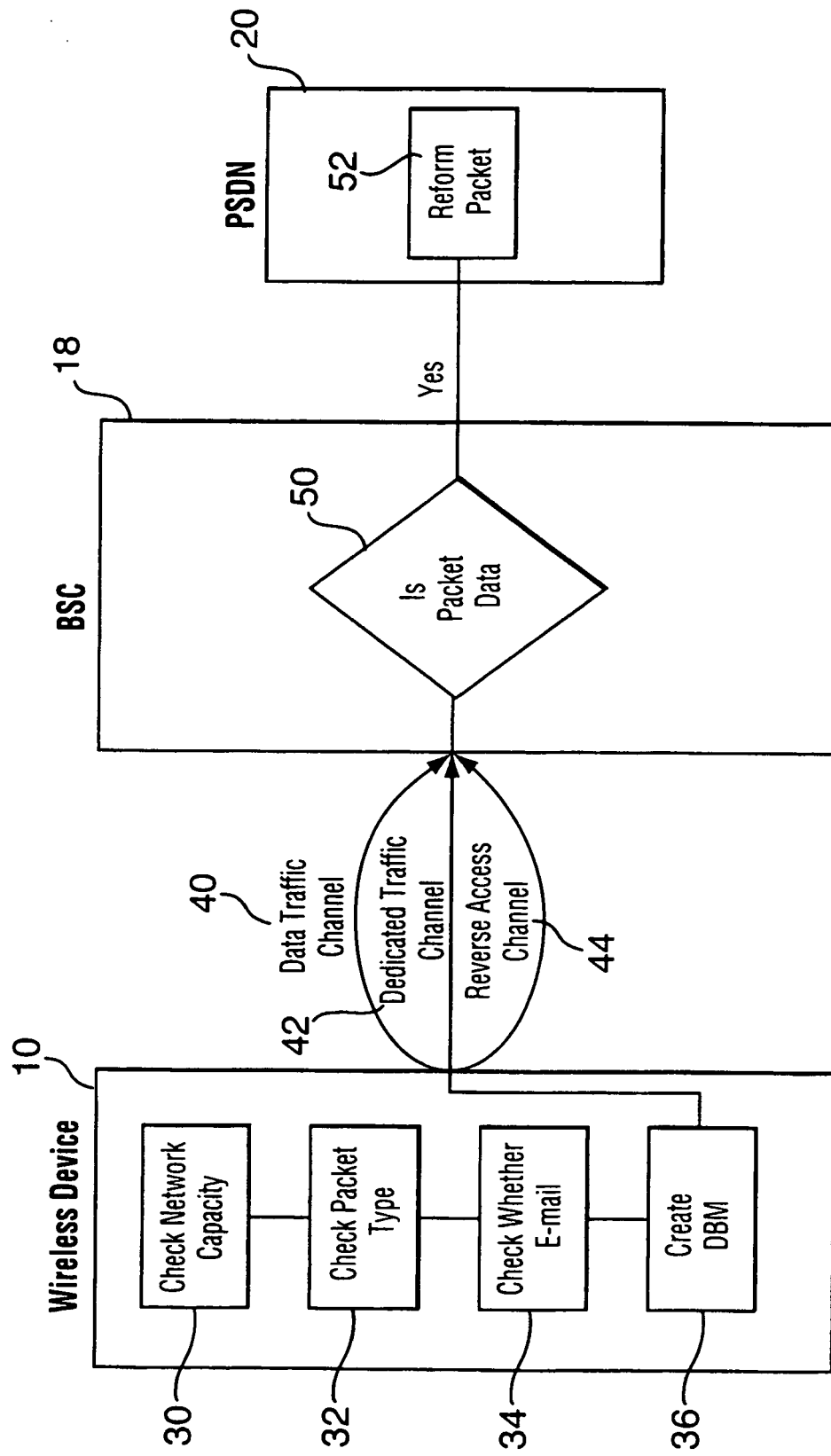


FIG. 2

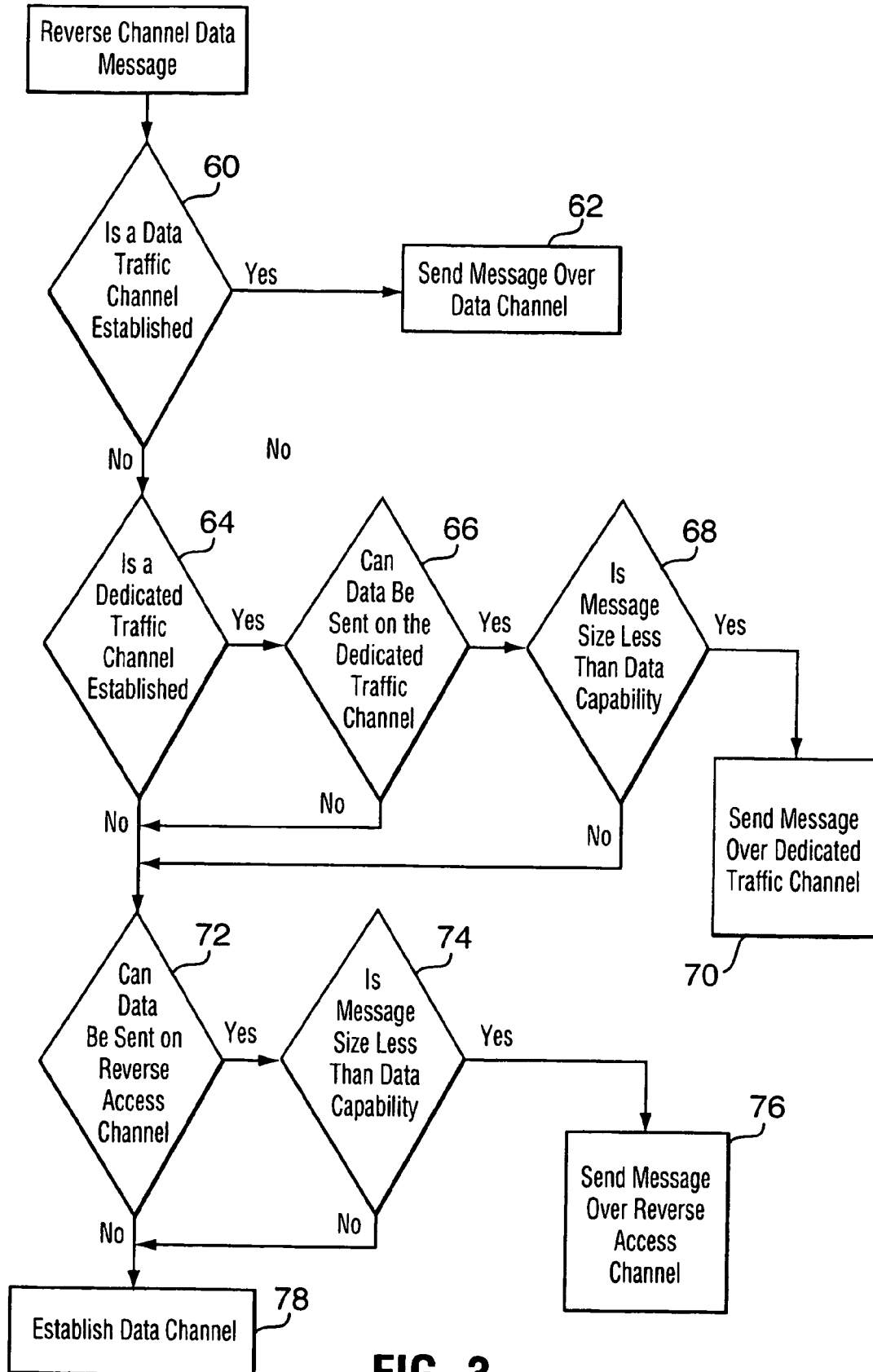


FIG. 3

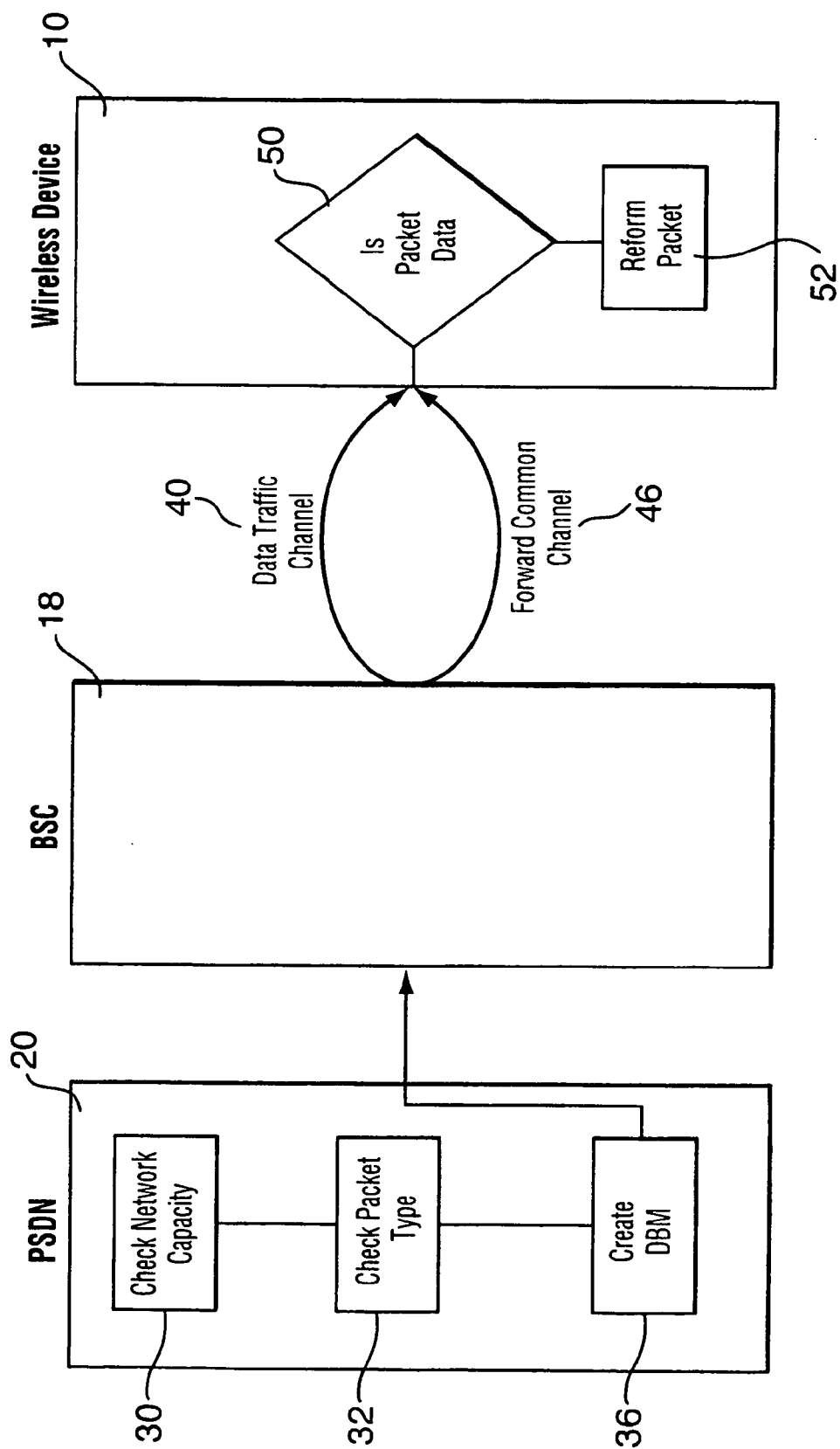


FIG. 4

REFERENCES CITED IN THE DESCRIPTION

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